

STUDIES IN *ENTOLOMA*6. — ON PINKISH SPECIES IN SUBGENUS *LEPTONIA*

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SUMMARY. — Five species of *Leptonia* with pinkish tinges in Europe are keyed out and described; a new species - *Entoloma callichroum* - and a new combination - *E. queletii* - are proposed.

RÉSUMÉ. — Clé de détermination et description de cinq *Leptonies* européennes à teintes rosâtres; une espèce nouvelle - *Entoloma callichroum* - et une combinaison nouvelle - *E. queletii* - sont proposées.

Pink species of *Leptonia* are rather rare, both in and outside Europe (HORAK, 1973, 1980; LARGENT, 1977; ROMAGNESI, 1941; ROMAGNESI & GILLES, 1979). In the excellent «*Flore analytique*» of KUHNER & ROMAGNESI (1953) four species are keyed out, but extensive descriptions of the species are lacking or scattered in literature. The present author was able to study both fresh and dried material of these beautiful species and therefore a key and descriptions are given of the species occurring in Europe.

Key to the species of *Leptonia* with pinkish tinges in Europe

- | | |
|--|------------------------|
| 1. Stipe with blue tinge, at least in lower part when fresh | 2 |
| 1. Stipe white, pink, or brownish | 3 |
| 2. Cheilocystidia present; clamp-connections absent | <i>E. catalaunicum</i> |
| 2. Cheilocystidia absent; clamp-connections present | <i>E. callichroum</i> |
| 3. Pileus weakly hygrophanous, translucently striate when moist, smooth, lilaceous-pink, turning more brownish with age, cheilocystidia absent | <i>E. ianthinum</i> |
| 3. Pileus not hygrophanous, not striate, entirely woolly-tomentose to (sub-) squamulose | 4 |

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CRYPTOGAMIE, MYCOLOGIE (*Cryptog., Mycol.*), TOME 4 (1983).

4. Pileus and stipe pink, sometimes more carmine or brown at centre of pileus; cheilocystidia usually present, versiform, clavate to lageniform or fusoid *E. roseum*
4. Pileus pink with whitish margin when young, then with more ochraceous-brownish tinges; stipe white slightly turning ochraceous-brownish with age; cheilocystidia more or less cylindrical to clavate *E. queletii*

***ENTOLOMA CATALAUNICUM* (Sing.) Noordeloos (Fig. 3)**

Leptonia catalaunica Sing., *Annls mycol.* 34 : 428. 1936. – *Rhodophyllus catalaunicus* (Sing.) Romagn. in *Bull. Soc. mycol. Fr.* 53 : 333. 1937. – *Entoloma catalaunicum* (Sing.) Noordeloos in *Persoonia* 11 : 470. 1982.

Coloured plate and description. – FAVRE, J., *Champ. sup. Zone Alp.* : 66, fig. 46, pl. VI⁴. 1955.

Pileus 7-45 mm broad, conical, hemispherical or truncate-campanulate when young, expanding to convex or planoconvex, with or without central depression, with inflexed margin when young, becoming rather irregularly shaped with age with undulating marginal zone, not hygrophanous, not striate, when young beautifully pink becoming flesh-coloured or ochraceous, finally brownish-pink with age, frequently with blue tinge near margin, entirely fibrillose-subsquamulose-woolly when young, then squamulose on disc and radially fibrillose-squamulose on limb, frequently radially splitting and showing the flesh in between the fibrils.

Lamellae L = 15-30, l = 3-7, moderately crowded, (deeply) emarginate, segmentiform to subventricose, white or creamy then pink, sometimes with slight grey tinge, with flocculose, concolorous or blackish-blue edge (see discussion below).

Stipe 30-60 x 2-5 mm, cylindrical or flattened, sometimes broadening towards base, creamy at apex, downwards pink, grey-blue in lower half, sometimes fading with age and gradually losing blue tinge, minutely white pruinose to flocculose at apex, downwards covered with darker bluish fibrils, sometimes tomentose, rarely almost smooth, base white tomentose.

Flesh white in pileus, blue-grey in stipe.

Smell and taste not distinctive or faintly pleasant.

Spores 9,0-10,4-(11,0) x 6,7-8,1 μ m, Q = 1,25-1,3-1,4, irregularly 6-9 angled in side-view with dihedral base.

Basidia 34-52 x 7-12,5 μ m, 4-spored without clamp.

Cheilocystidia versiform, 24-75 x 7,5-20 μ m, numerous, lamellar-edge entirely sterile, cylindrical to fusiform, sometimes appendiculate or lageniform, in old specimens turning into hyphoid elements and forming ■ sterile layer, colourless or with blue intracellular pigment.

Pileipellis ■ trichoderm or at centre of pileus almost a hymeniderm, made up of broadly inflated 12-27 μ m wide cells, with pale brownish intracellular pigment. Clamp-connections absent.

Habitat and distribution. — On grassy spots, river-beds, road-sides, preferably on calcareous rock in subalpine habitats, among others found with *Pinus mugo* and *Salix retusa* or with *Picea*, *Alnus viridis* and *Berberis*. Known to occur in the Alps and Pyrenees.

Collections examined. — Austria, N-Tirol, Jenbach, Rosskogel, 7 Sept. 1982, M. E. NOORDELOOS 1711a & b; idem, Achenkirch, Achenwald, 6 Sept. 1982, Th. W. KUYPER (both in L). — Switzerland, Graubunden, Plattamala, Ramosch, Unter Engadine, 31 Aug. 1970, E. HORAK 79/354(ZT), and 16 Sept. 1980, E. HORAK 79/514 (ZT).

Entoloma catalaunicum is a very distinctive species which prefers (sub-) alpine habitats, and it is widely distributed in Europe. Thanks to material and extensive descriptions made by Dr. E. HORAK, Zürich, and kindly send to me, and rich collections gathered by me during the so-called «dreiländertagung» in Austria, Sept. 1982, I was able to get a good impression on the variability of this striking species. Remarkable are the colour-changes of the basidiomes during the development. The blue tinges, always present in young carpophores on the stipe and less frequently also on the margin of the pileus, may disappear entirely with age, but remain long visible in the cortex of the stipe, and make identification of old carpophores still possible. One collection, viz. NOORDELOOS 1711b, showed in some specimens a partly to entirely blackish-blue lamellar edge, caused by a similarly coloured intracellular pigment in the cheilocystidia. As far as I know this has never been recorded for *Entoloma catalaunicum*. In the case mentioned the lamellae resembled very much those found in *E. serrulatum*. *Entoloma catalaunicum* is easy to distinguish from *E. callichroum* by the nature of its stipe-surface and microscopical characters. *Entoloma roseum* and *E. ianthinum* differ among other things by the lack of blue pigments.

ENTOLOMA CALLICHROUM Horak & Noordeloos, spec. nov.

(Fig. 1)

Pileus circiter 22 mm latus, convexus, papillatus, lilacino-roseus, haud hygrophanus, haud striatus, radialiter fibrillosus. *Lamellae* L = 10-12, l = 1-3, emarginatae, albiae versus margine lilacinae. *Stipes* 40 x 2 mm, cylindraceus, chalybaeus, fibrillosus, fistulosus. *Sporae* 10-12,5 x 7-9 µm, angulatae. *Basidia* 4-sporigera. *Cheilocystidia* nulla. *Pileipellis* trichoderma. *Pigmentis* intracellulosis. *Fibulae* presentes. *In silvis sub Alno incana*. — *Holotypus* : E. HORAK 71/58, 3 VIII 1971, «Schweiz, Graubunden, Form» (ZT).

Pileus about 22 mm broad, convex with small papilla, not hygrophanous, not striate, beautifully lilaceous-pink, radially fibrillose.

Lamellae L = 10-12, l = 1-2, emarginate, subventricose, whitish with lilaceous sheen towards edge, but with entire, concolorous edge.

Stipe about 40 x 2 mm, cylindrical, steel-blue, longitudinally fibrillose, whitish tomentose at base, fistulose.

Spores 10-12,5 x 7-9 µm, multi-angled ellipsoid in outline with blunt base.

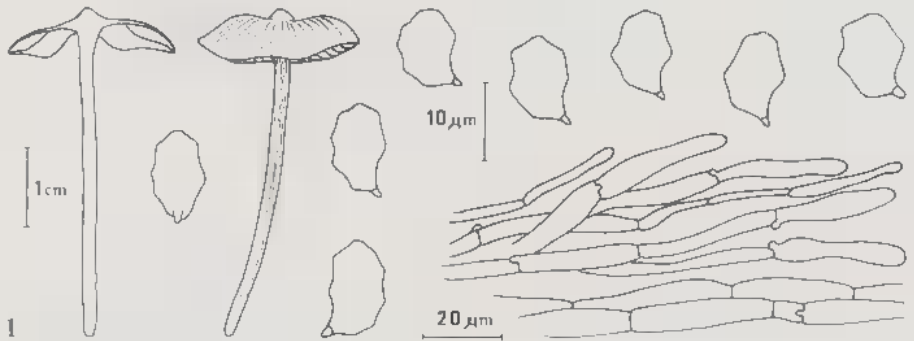


Fig. 1. - *Entoloma callichroum* Horak & Noordeloos. Habit: spores; pileipellis (all fig. from holotype).

Basidia 30-40 x 13-15 μ m, 4-spored with clamp.

Cystidia absent.

Pileipellis a trichoderm of septate, 10-18 μ m wide clamped hyphae with intracellular pigment.

Habitat. - In forest under *Alnus incana*.

Collection examined. - Switzerland, Graubunden, Forna, 31 Aug. 1971, E. HORAK 71/58 (Holotype, ZT).

Because of its bright lilaceous-pink pileus and blue stipe *Entoloma callichroum* is a very distinct species which has to be placed in section *Leptonia* because of its papillate pileus, the structure of the pileipellis and the clamped hyphae. It comes close to *Entoloma dichroum* in its original sense non Fr. 1849 (NOORDELOOS, 1982 : 462) from which it differs in colour, size and shape of the spores and lacking cheilocystidia. *Entoloma ianthinum* differs in having a depressed, smooth, translucently striate pileus, slightly different colour and in lacking clamps, which place it in section *Cyanula*.

ENTOLOMA ROSEUM (Longyear) Hesl. (Fig. 2)

Leptonia rosea Longyear in Trans. Mich. Acad. Sci. 3 : 59, 1902 (non *L. rosea* Rick in Broteria 17 : 107, 1919). - *Rhodophyllus roseus* (Longyear) Moser, KL Kryptog. Fl., 3 Aufl., 2 b/2 : 158, 1967. - *Entoloma roseum* (Longyear) Hesl, in Beih. Nova Hedwigia 23 : 165, 1967.

Entoloma griseocyaneum var. *roseum* R. Maire in Trans. Br. mycol. Soc. 3 : 170, 1910.

Description. - P. D. ORTON in Trans. Br. mycol. Soc. 43 : 300-301, 1960.

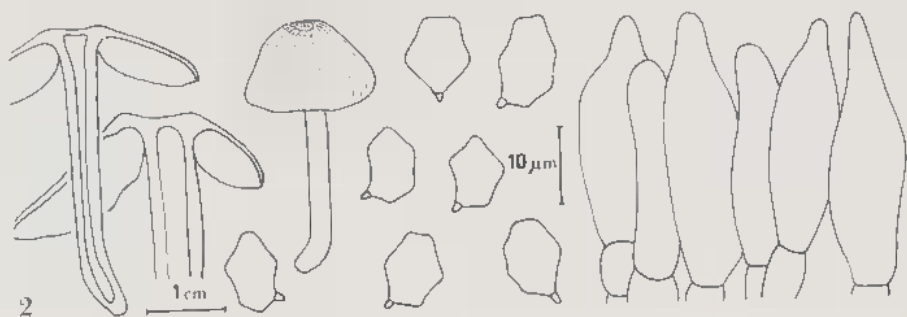


Fig. 2. — *Entoloma roseum* (Longyear) Hesl. Habit: spores; cheilocystidia (all fig. from Bas 5847).

Pileus 15-30 mm broad, truncate conico-campanulate, hemispherical or conico-convex, only slightly expanding, usually with more or less pronounced umbilicus, with inflexed margin when young, not hygrophanous, not striate, deep rosy-pink when young, usually with slightly darker carmine or brownish-red centre, slightly fading with age, entirely dull and velvety becoming granular-subsquamous on disc and more radially-fibrillose-subsquamous on limb with age.

Lamellae $L = 15-20$, $l = 3-7$, emarginate, (sub-)ventricose, white then pink, finally salmon with concolorous, entire or slightly pruinose edge.

Stipe 25-60 x 2.5-6 mm, cylindrical, rarely flattened, sometimes broadening towards base, almost with same colour as pileus, becoming brownish-pink with age, smooth or white pruinose, white tomentose at base.

Flesh pale pinkish in cortex, inner parts white. Smell and taste not distinctive.

Spores 8.7-10.4-(11.5) x 7-8.1 μm , $Q = 1.15-1.3-1.5$, in side view irregularly 6-9 angled with blunt dihedral base.

Basidia 4-spored.

Cheilocystidia present or not, sometimes rendering lamellar edge entirely or partly sterile, 20-50 x 5-17 μm , versiform, broadly cylindrical-clavate to lageniform or fusoid, colourless.

Pileipellis a trichoderm, at centre of pileus almost a hymeniderm, made up of inflated terminal cells up to 35 μm wide, with pale intracellular pigment.

Clamp-connections absent.

Habitat and distribution. — In grassland, pastures, also open *Salix repens* vegetation in coastal dunes in the lowland of NW-Europe. Rare.

Collection examined. — Great Britain, Scotland, Invernessshire, Tomich, 10 Sept. 1963, R. WATLING (E); Northumberland, Ross Links, 22 Sept. 1971, C. BAS 5847 (L); Yorkshire, Ingleton, 23 Sept. 1957, W. BRAMLEY (E); Lancashire, Yeland Hall Allotment, 16 Sept. 1978, R. LIVERMORE (E). Netherlands, prov. Overijssel, Ommen, estate «Stekkenkamp», 7 Sept. 1966, J. J.

BARKMAN 8182 (WBS).

Entoloma roseum and *E. catalaunicum* are microscopically very similar, but in *E. roseum* the presence or absence of cheilocystidia is a variable character. In BARKMAN 8182 I failed to find any, while in the British collections usually the lamellar edge was entirely or partly sterile with well-modified cheilocystidia. This was also observed by ORTON (1960). LARGENT (1977) described a form of *E. roseum* with coloured edge of lamellae, but I do not attach very much taxonomic value to this character. Furthermore *Entoloma roseum* and *E. catalaunicum* differ in pigmentation and habitat.

ENTOLOMA IANTHINUM (Romagn. & Favre) Noordel.
(Fig. 4)

Rhodophyllus ianthinus Romagn. & Favre in Rev. Mycol. 3 : 76, 1938. —
Entoloma ianthinum (Romagn. & Favre) Noordel. in Persoonia 11 : 470, 1982.

Pileus up to 30 mm broad, hemispherical then campanulate-conical with slight depression at centre, hygrophanous, when moist translucently striate up to centre, lilaceous-fleshcolour with brownish-lilaceous centre, slightly radially wrinkled, smooth except on disc which is finely velvety-subsquamulose, margin slightly involute.

Lamellae L = 13-20, l = 3-7, adnate to slightly emarginate with decurrent tooth, thin, fairly broad, pale fleshcolour or pink then with brownish tinge.

Stipe up to 55 x 3 mm, cylindrical, lilaceous at apex, more fleshcolour below, smooth, dull, base white tomentose.

Flesh concolorous with surface, slightly bluish in pileus and strongest so around umbilicus.

Taste slightly raphanoid.

Spores 9.3-11.5 x 6.7 μ m, Q = 1.45 on the average, irregularly 6-8 angled in side-view with distinctly dihedral base.

Basidia 22-27 x 9-12 μ m, 4 spored without clamp.

Cystidia none.

Pileipellis a cutis with transitions to a trichoderm, made up of cylindrical, thin-walled, 10-12 μ m wide hyphae, with some inflated up to 16 μ m wide terminal cells.

Pigment intracellular.

Clamp-connections absent.

Collections examined. — France, Doubs, near Russey, Aug./Sept. 1936, J. FAVRE (Holotype, Herb. Romagn., PC).

Entoloma ianthinum clearly differs from *E. roseum* in colour, structure of pileipellis and lack of cheilocystidia while *E. catalaunicum* differs both in colour,

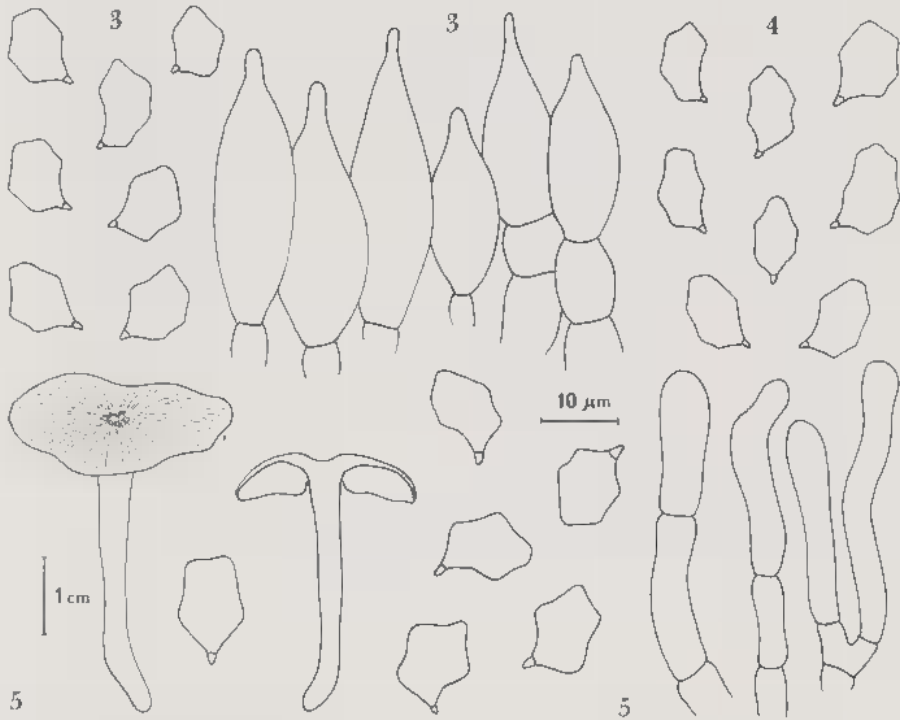


Fig. 3. — *Entoloma catalaunicum* (Sing.) Noordeloos. Spores and cheilocystidia (from NOORDELOOS 1711).

Fig. 4. — *Entoloma ianthinum* (Romagn. & Favre) Noordeloos. Spores (from holotype).

Fig. 5. — *Entoloma queletii* (Boud.) Noordeloos. Habit; spores and cheilocystidia (all fig. from JACOBSSON & STRIDVALL).

structure of the surface of the pileus, and the presence of cheilocystidia. *Entoloma queletii* lacks the lilaceous tinges in the pileus and has a white stipe. So far *E. ianthinum* is only known from the type-locality.

***ENTOLOMA QUELETHII* (Boudier) Noordeloos, comb. nov.**
(Fig. 5)

Basionym : *Leptonia queletii* Boudier in Bull. Soc. bot. Fr. 24 : 307. 1877. - *Rhodophyllus queletii* (Boudier) Quéll., Enchiridion : 61. 1886.

Pileus 15-40 mm broad, hemispherical then convex often with slightly depressed centre when old, not hygrophorous, not striate, when young pink to pink-vinaceous at centre and more whitish towards margin, turning more ochra-

ceous-brownish with age, woolly-tomentose to subsquamulose all over.

Lamellae L = about 30, l = 1-3-(5), emarginate, ventricose, white then pink.

Stipe 40-50 x 3-5 mm, cylindrical, sometimes with bulbous base, white then with ochre tinge, fibrillose-striatulate all over, fistulose.

Spores (10)-10,4-11,7-(12,1) x (7,6)-8,1-8,7-(9,3) μm , Q = (1,15)-1,3-1,35-1,45-(1,55). 5-6 angled in side view with dihedral base.

Basidia 4-spored, clampless.

Cheilocystidia 22-56 x 7-12 μm , abundant, more or less cylindrical.

Pileipellis a trichoderm made up of up to 15 μm wide, cylindrical hyphae with intracellular pigment. Lactiferous hyphae numerous in pileitrama. Clamp-connections abundant.

Habitat and distribution. — In deciduous forest (*Fraxinus*, *Acer*, *Corylus*); known to occur in France and Sweden.

Collection examined. — Sweden, Västergötland, V. Tunhem, 19 July and 24 Aug. 1980, L. STRIDVALL & S. JACOBSSON (GB).

The collection described above agrees perfectly with the diagnosis and plate of BOUDIER, and also with the description given by PEARSON (1928 : 3). *Leptonia andrianae* Bres. and *E. kervemii* (Gill.) Noordel. are related species, but lack pink tinges.

ACKNOWLEDGEMENTS

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